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ABSTRACT

The conditions for effective and efficient provision of distance education in the small-scale integrated mode normal in Australian higher education are outlined in this paper. Criteria for the evaluation of effective distance education are listed as follows: (1) student learning of information and understanding; (2) student satisfaction with the content and processes of the course; (3) retention and graduation rates; and (4) employability or advancement within employment. Efficiency is defined in terms of the relationship between inputs, such as equipment cost and salaries, and outcomes, i.e., educational effectiveness. The impact on effectiveness and efficiency of various approaches to distance education is briefly described for each of the following activities: academic production, materials production, distribution, interaction, assignments and other learning activities, assessment, evaluation, and student support/guidance. Measures that would yield economies of scale are suggested, and difficulties and obstacles to the measures are discussed. (MES)

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EFFECTIVENESS AND EFFICIENCY IN DISTANCE EDUCATION

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TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

In Australian tertiary education distance education is a large operation. Seven universities are engaged in it, five in a large way (at least one thousand enrolments). In 1985 there were sixteen thousand university students in this mode comprising nine per cent of enrolments; the number has doubled since 1975. Thirty colleges of advanced education offer external studies, at least nine of them with over one thousand enrolments. There were twenty-nine thousand external advanced education enrolments in 1985 comprising fifteen per cent of enrolments; the number has trebled since 1975. In the TAFE sector each State has an external studies operation with a total of about sixty thousand enrolments; the growth in this sector has been more gradual than in the others.

There are over eight hundred external studies courses available in higher education. At least fourteen institutions offer business/commerce/economics externally and all the TAFE systems offer accountancy and finance-related courses externally. Eighteen institutions offer teacher education externally and there is duplication also in some areas of science and applied science, mathematics, the social sciences, the humanities and computing. At the other extreme one can find nationally two external courses in winemaking, one in Portuguese, one in occupational therapy, one in music, two in Latin and one in fine art.

The biggest fields of study by enrolment are business/commerce/economics, teacher education, some humanities and social sciences, and applied science. In higher education nursing may soon be added to these. The biggest single area in TAFE appears to be business and administration.

Given that picture there would appear to be considerable scope for improving effectiveness and efficiency by minimising overlap of offerings and consequent waste of effort in the development, production and teaching of courses.

Different countries have approached the provision of distance education at tertiary level in different ways. Britain established the Open University in 1969 to be the single national provider and it offers its courses only in the external mode. In the subsequent decade many countries have followed this model, one of the most recent being Japan with its very large scale and technological University of the Air. Australia, which has been offering external tertiary studies since 1910, has a large number of providers and in higher education no institution is totally devoted to external studies; they all teach both external and face-to-face students. The situation in Canada is rather similar except that they also have at least two institutions, Athabasca University and the Open Learning Institute of British Columbia, which teach only in the external mode. New Zealand has, like Britain, only one national provider, Massey University; but it teaches face-to-face as well as external students on the Australian pattern.

Alongside different national approaches there are different institutional patterns of provision.

- The British Open University has over sixty-five thousand students; it does not provide courses for less than one thousand enrolments at a time; it provides no library services for students, and they rely on the public library network; some ten per cent of its teaching is through broadcast radio and television.

- The Japanese University of the Air talks of an ultimate enrolment of some four hundred thousand students; some thirty per cent of its teaching is through broadcast television but it requires students to have two hours per week of face-to-face teaching in regional study centres; it too provides no library services for its students.

- Waterloo University in Canada relies very heavily on audiotapes of lectures given to face-to-face students.

- The Open Learning Institute has no academic staff and lets contracts to outside academics for the development of its course materials; to teach and assess the students it hires outside teachers at part time rates of pay.

- Within Australia most TAFE systems use one centralised facility to service the whole State, such as the Technical Correspondence School of the Queensland Department, but Victoria operates through a network of colleges which are primarily serving face-to-face students. Deakin University likes to develop its courses through course teams whereas the University of New England generally leaves it to the single academic responsible for the course; the former method can result in a quite elaborate production, the latter in a quite simple and very flexible production, easy to alter. Mitchell CAE and some other institutions require all external students to attend a residential school in each course; Murdoch University and several other institutions do not have such a requirement, and some may make no provision for residential schools.

All these different arrangements have their merits and their weaknesses. The one clear fact is that there is no panacea, no single best way to provide external studies.

Given the present situation and range of practices in Australia, how can the effectiveness and efficiency of external tertiary education be improved?

Some political leaders and other people talk as if the satellite and the new technology will solve all our problems. They sometimes speak as if education were simply a matter of taping a lecture and broadcasting it nation wide: two simple and inexpensive processes. If that were all that education involved

we could have been doing it at any time in the last fifty years. We have not done so because such a process is not likely to be effective education. In such a simple operation:

- The lecture may or may not be well prepared and delivered.
- There is no necessary activity by the student.
- There is no interaction between the student and the teacher or other students.
- The broadcast requires the student's attention at a fixed time, which may be inconvenient or impossible.
- The broadcast is ephemeral unless the student records it.
- The operation is very impersonal for the student and this can be discouraging to many students.

Effective distance education, like other modes of education, should meet all those objections and should be evaluated by at least four criteria:

- Student learning of information and understanding, which are usually measured by academic assessments.
- Student satisfaction with the content and processes of the course, which is usually measured by a questionnaire to the student.
- Retention rates and graduation rates.
- Employability or advancement within employment.

Educational effectiveness in external studies depends on at least eight activities:

- First, academic production: The decisions on course content and topics, educational approach, examples, exercise and practical work, which ultimately depend on the educational goals of the course and the philosophy of the teachers.

- Second, materials production: The production of the written materials, illustrations, audiovisual materials, kits and so on.

- Third, distribution: By mail or broadcast or facsimile or computer or whatever; to individual students or to regional centres used by groups of students.

- Fourth, interaction: Of student with teacher or with other students; by mail, telephone, computer etc; individually or in groups; at a distance (through tele-conference) or face-to-face.

- Fifth, exercise: Readings, library materials, practical work, work experience, assignments.

- Sixth, assessment: To diagnose student learning, to gauge student progress, to measure student attainment.

- Seventh, evaluation: Of course content, course materials, methods of presentation, delivery, student support systems; the possible need for changes to any of these.

- Eighth, student support/guidance: Before enrolment or during course; educational and psychological support; by academic and general staff and by other students or other people.

In all these activities different approaches and techniques can lead to different outcomes to be judged against the four criteria of educational effectiveness mentioned above: student learning, student satisfaction, continuation rates, employability. For instance academic production can be done by a single academic or a course team; the materials produced can be simple and inexpensive in format or can be produced to full commercial standards. There may well be different educational outcomes from these different approaches. Similarly varying results might come from a course with a residential school as against one without; from an operation conducted by a dispersed campus, as the Victorian TAFE Off-Campus Network essentially is, compared to an operation centralised in a single institution; from an institution which makes use of dispersed study centres as against one which makes no such provision. There is a need for constant evaluation of all these activities.

Given this summary of the aspects of effectiveness, how is efficiency to be approached? Efficiency in each of these fields is a relationship between outcomes and inputs.

. In academic production the main input is staff time and may be measured in salaries. The input occurs in a single institution where the time of a course team or a single academic might be involved, and the efficiency of each approach must be gauged in the light of the educational effectiveness of the approach. The input can be viewed nationally when considering the duplication of offerings by several institutions in a national picture.

. Materials production: This includes the adaptation of face-to-face materials for external studies, also editing and printing, graphic design and audiovisual production. How can materials be produced in the most efficient way? In a given case is it more efficient to produce or to

buy or lease existing materials? The choice of media also includes considerations of efficiency.

- Distribution: Is it more efficient by mail or broadcast or by telephone or computer links? To individual students or regional centres?

- Interaction: Which modes of communication at a distance are most efficient for interaction? If face-to-face contact is desired is that more efficiently achieved by an academic staff visit to a region or by a residential school or other means? A relevant question is, who pays the costs of such interaction? The fact that a residential school is paid for largely by the individual students at relatively low cost to the institution does not necessarily make it an efficient or low-cost operation.

- Exercise: Efficiency would involve questions of its quantity and relevance and nature: is it paperwork? Practical work? Work experience? Again, the costs may be borne by the institution or the student or an employer but efficiency should take account of the level of costs no matter who meets them.

- Assessment: What is its quantity? Its frequency? Is it all necessary? When does it occur during the course? Is there productive feedback to students?

- Evaluation: How much should there be? By whom: academics, general staff (for instance printing operators), students? When should it occur? What does it cost? What are the outcomes?

- Student support: There are costs in staff time and salaries, equipment, library resources, postage, telephones, and accommodation. Costs should be measured against outcomes in all these areas.

Obviously efficiency is achieved or improved by a reduction in costs or inputs or effort without reductions in the quality or effectiveness of the education. The scope for improvements in efficiency rests mainly on the first two activities, academic production and materials production. A quest for efficiency would seek to eliminate unnecessary duplication in the production of courses; it would seek to concentrate more students in any given course and more students for any given producer. These measures would yield economies of scale so that a single process of academic production or of materials production reached a larger number of students and thus diminished the cost per student of the operation.

There is some scope for economies of scale in the processes of distribution, interaction and student support, where increased numbers of students might be able to use particular facilities at no increase in the costs of operating the facilities. There is little scope for economies of scale in the processes of exercise or assessment or evaluation.

Economising measures such as those suggested are also likely to lead to greater educational effectiveness because, although the cost per student unit is reduced, the total resources or effort dedicated to the educational process may be increased and give scope for an improvement in quality.

To achieve the economies and efficiencies suggested above it is not necessary to limit rigidly the number of institutions which might be involved to some extent in external studies provided their involvement takes a particular form. Institutions which have particular academic specialisms which could be offered externally would be able to do so without incurring high production costs if they were to produce and to deliver in conjunction with other institutions which do have a well established infrastructure of instructional designers, editors, graphic artists, audiovisual facilities, printing and mailing facilities. It is these facilities which should not proliferate.

All the foregoing refers to effectiveness and efficiency within distance education. There is also scope for effectiveness and efficiency through distance education in tertiary education generally. This can occur in at least four ways:

. Specialised subjects available in only one centre could be made available nationally through external study. For instance, several foreign languages such as Dutch, Portuguese, Thai or Korean, which all have some relevance to Australian diplomatic and trade relations, are each available in only one course throughout the nation. Actuarial studies are available at only one institution and museum studies at only two. There are many such examples and such courses could be made available to a wider clientele with greater effectiveness and efficiency by cooperation with a major external studies provider.

. More use of external studies could reduce the duplication of face-to-face courses with small enrolments. For instance Macquarie University teaches externally Croatian, Macedonian, Polish, Serbian, Ukrainian; ANU students of Russian who wish to study one of these other Slavonic languages enrol externally with Macquarie and count these units towards their ANU degree. In this way ANU offers a wider range of subjects to its students without the cost of maintaining a teaching program which would not be viable.

. It might be possible to prepare external study programs which could be taken over the summer vacation to enable students to accelerate their educational progress or to redeem their failure in one or two units without going to the expense of mounting extensive face-to-face teaching programs.

. External studies obviously diminish the need for classrooms and facilities on campus and for expenditure on furniture, lighting, heating, cleaning and general maintenance. These savings are to some extent offset by higher postal and telephone costs than in face-to-face teaching but until precise costings are made the presumption is that the savings outweigh the expenditures in these fields.

The measures suggested above for greater effectiveness and efficiency require a great deal of cooperation between institutions and in fact come close to setting up a national system which operates through a network of institutions instead of a single institution on the British model. The obstacles to this are clearly recognisable. Each institution and almost every individual academic cherishes autonomy in the production of courses. There is an innate resistance to collaborative course development, to course sharing and to transfer of academic credit.

In addition some State authorities are not totally committed to interstate cooperation and some institutions are wary of operating outside their State. I have been told of one State where the government will not permit the State Library inter-loan facilities to be used for students resident in the State but enrolled externally in out of State institutions. I have been told of one educational institution which, at least until recently, would not post its library books to its own students if they lived in a different State. I have been told of some institutions which believe that their State authorities do not favour their enrolling students from outside the State.

One vexed question is that of residential schools. The institutions which make them compulsory are convinced of their high educational effectiveness and I am not here questioning that. However the requirement does impose a cost on students and on employers and it effectively limits the zone of recruitment of such students; while one can point to individual students who travel

great distances and even between continents to attend residential schools, these are exceptional cases, and a rule of thumb is that students do not enrol if they must attend a residential school more than one day's drive from home.

All the difficulties and obstacles which I have mentioned above are basically questions of attitude and policy and therefore can be changed. For a long time this country led the world in the provision and practice of distance education and it still has a high reputation in that field. The Australian methods offer an alternative to the British example, an example which, for all its merits, is costly to establish. With relatively few changes in our structures of provision, in cooperation and coordination, in course production and credit transfer and student support we could again lead the world in the provision of distance education by relatively small scale institutions at relatively low establishment costs with academic standards equivalent to those offered face-to-face, a system of distance education well suited to countries of middle rank economies and middle to low levels of communications technology.